



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,904	05/06/2002	Victor John Yannacone, Jr.	3305-012184	1012

7590 03/25/2008  
Randall A Notzen  
700 Koppers Building  
436 Seventh Avenue  
Pittsburgh, PA 15219-1818

EXAMINER
----------

LAMPRECHT, JOEL

ART UNIT	PAPER NUMBER
----------	--------------

3737

MAIL DATE	DELIVERY MODE
-----------	---------------

03/25/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/019,904	<b>Applicant(s)</b> YANNAKONE, JR. ET AL.	
	<b>Examiner</b> Joel M. Lamprecht	<b>Art Unit</b> 3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 9, 13, 15, 17-20, 22, and 24 are objected to because of the following informalities: Regarding claim 9, “the at least one marker” lacks antecedent basis. Regarding claim 13, it is unclear what additional steps in the method are being set forth. Regarding claim 15, it is unclear what further structural limitation has been set forth. Regarding claims 17-20, the claims include functional language which is unsupported by the structure required to produce such a function. Regarding claims 20, 22, and 24, it is unclear what further structural limitation is set forth. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 4, 7, 14-17, 23, and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Parsons et al (US 6,757,412 B1). Parsons et al discloses a device and method for analyzing tissues based on values of data acquired by the reflected IR-radiation from a patient (Col 3 Line 33-55). Additionally, Parsons et al discloses the acquisition of multiple frames of IR radiation data (Col 5 Line 55-Col 6 Line 15), the

mapping of those data points as gray/color values corresponding to the position of the data in the field of view (Col 14 Line 30-Col 16 Line 20), the acquisition of data over an interval (Col 5 Line 55 - Col 6 Line 8), the determination of a rate of change of the data over time (Col 7 Line 43-Col 10 Line 5), and the conditioned "challenge" of the patient through the administration of air at a different temperature than ambient air (Col 6 Line 15-42). Parsons et al disclose the use of a sensor array-based system, such as the TIP-4 thermal imaging processor (Now owned by CTI) as incorporated by reference to (5,999,842, specifically at Col 4 Line 36-50 of the '842 patent). Parsons et al finally discloses the use of processing technology for acquiring pixel data, which would inherently be done between the same data points in each frame for the results to be meaningful and pertinent to the application, (Col 9 Line 50-Col 10 Line 20) over multiple frames and plotting the change in the acquired data to assist in diagnosis of pathologies (Col 14 Line 7 – Col 15 Line 67).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 5, 6, 10, 12, 13, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parsons et al in view of Liu et al (US 6,023,637). Parsons et al, as disclosed above, substantially discloses the invention as claimed, however fails to disclose adjusting for absolute temperature and the use of a mirror in obtaining data. Liu, et al. also discloses a method and apparatus for thermal imaging and additionally discloses that the intensity is adjusted to compensate for variance in base levels of intensity of thermal radiation from patient to patient (Col 13, lines 9-12), which would advantageously provide the ability to compare data between patients. Liu et al further discloses alternatives available for the sensor, such as a single point infrared sensor or either a linear or two-dimensional array of sensors. The use of an array of sensors provides a reduction in sampling time, as multiple optels are acquired at substantially the same time as opposed to using a single point sensor where radiation is measured sequentially from each optel (Col 10, lines 29-46). A scanner mirror (fig. 11, element 130) is used to focus radiation obtained from the patient to the detection system. The system may produce three-dimensional images (Col 11, line 43). This system may be used in the detection of tumors, which is an abnormal growth of tissue or a neoplastic disease process. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Parsons et al in light of the teachings of

the reference by Liu et al to include simultaneous detection of an array as well as a mirror to allow sampling of portions of the patient not in the field of view of the detector system without moving the entire detector system to a new field of view, which would both reduce sampling time.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parsons et al in view of Webber (US 6,081,577). Parsons et al, as discussed above, substantially discloses the invention as claimed, however fails to explicitly disclose the use of a marker on the patient. Webber discloses a three-dimensional imaging system that may be practiced using infrared light (Col 2, line 59). Additionally, Webber discloses the use of fiducial markers which may be held in a fixed position relative to a selected object, such as a patient, or may be directly attached to the object (Col 7, lines 32-35). In order for a fiducial marker to be seen in an image it must have emissivity different than that of the patient. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Parsons et al in light of the teachings in the reference by Webber to include fiducial markers in order to aid in a variety of image processing techniques well known in the art, such as registration, three-dimensional reconstruction, or determination of location of a tumor.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Parsons et al in view of Liu et al as applied to claim 10 above, and further in view of Nelson, et al (US 6216540). Parsons et al in view of Liu et al, as discussed above, substantially discloses the invention as claimed, however fails to disclose the use of a grid. Nelson et al also discloses a system and method for thermal imaging of an object and further

discloses the use of a grid. Nelson et al teaches that image quality may be improved through the use of a collimation grid (Abstract). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Parsons et al in view of Liu et al further in light of the teachings of Nelson et al to include a grid to provide improved image quality.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Parsons et al in view of Parker et al (US 5,533,139). Parsons et al, as discussed above, substantially discloses the invention as claimed, however fails to disclose logarithmic image acquisition. Parker et al also discloses an infrared imaging system and additionally discloses the use of real time logarithmic image acquisition (Col 3, lines 5-8). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Parsons et al in light of the teachings of Parker et al to include logarithmic image acquisition to reduce overall image storage requirements while still obtaining the most data at the beginning where the largest changes in temperature are occurring.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parsons et al in view of Gordon, et al (US 5,692,510). Parsons et al, as discussed above, substantially discloses the invention as claimed, however fails to disclose the use of synchronized acquisition. Gordon et al also discloses a thermal imaging system and further discloses that the end-diastolic images were selected to be stored by the system based on a triggering system synchronized by an ECG R-wave (Col 6, lines 29-34). The stored frames, therefore, were separated by at least one frame of data that

was not stored, such as those images acquired during systole. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the disclosure of Parsons et al in light of the teachings of Gordon et al to use synchronized data acquisition to, as Gordon states, reduce motion artifacts.

***Response to Arguments/Affidavits***

The declaration filed on 10/23/06 under 37 CFR 1.131 is sufficient to overcome the Dickey et al (6,381,488) reference.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joel M. Lamprecht whose telephone number is (571) 272-3250. The examiner can normally be reached on Monday-Friday 8:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571)272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ruth S. Smith/  
Primary Examiner, Art Unit 3737

JML